



Guardian
User Manual
Version 1.1

Institute of Clinical Physiology CNR Pisa - Italy

**Interactive computerized system implementing the WHO 2007 guidelines
for the assessment and management of cardiovascular risk**

User Guide



Table of Contents

Introduction	5
Part I	6
Getting Started	6
Installing Guardian	7
<i>Installing on Windows</i>	<i>7</i>
<i>Installing on Mac OS X</i>	<i>7</i>
Starting application	8
Configuring Guardian	9
Quitting Guardian	11
Part II	12
Using Guardian	12
Evaluating/calculating cardiovascular disease (CVD) risk	13
<i>Creating new patient record</i>	<i>13</i>
<i>Browsing patient records</i>	<i>14</i>
Generating report	16
<i>Personal data</i>	<i>17</i>
<i>Clinical data</i>	<i>18</i>
<i>Printing report</i>	<i>20</i>
<i>Saving data</i>	<i>21</i>

Introduction

In the framework of promoting the prevention of cardiovascular disease, the World Health Organization (WHO) has produced new guidelines (1) for the assessment and management of cardiovascular risk.

The present software is named GUARDIAN, that stands for: **GU**idelines for **cARDI**ovascular **A**r risk impleme**N**ted through an interactive computerized access. It represents an interactive implementation of the WHO guidelines that provide evidence-based guidance on how to reduce the incidence of cardiovascular disease in two categories of people - see also (2). These are:

1. People who have not (yet) developed clinically manifest cardiovascular disease (**primary prevention**). For these people the software:
 - a. estimates the risk by using the recently developed World Health Organization/International Society of Hypertension (WHO/ISH) [risk prediction charts](#) that are specifically tailored for individual world subregions and enable an estimation of the 10-year absolute cardiovascular risk;
 - b. provides evidence-based recommendations on specific preventive actions to initiate, and with what degree of intensity.
2. People with established cardiovascular disease (**secondary prevention**). These people already have a high cardiovascular risk, so computerized risk stratification is not required for making treatment decisions. The software provides evidence-based recommendations on intensive lifestyle interventions and appropriate drug therapy.

To whom GUARDIAN is aimed. Like the guidelines from which it is derived (1, 2) GUARDIAN can be used by physicians and non-physician health workers, at all levels of health care including primary care.

DISCLAIMER: All reasonable precautions have been taken by the Authors of GUARDIAN to verify the information contained in this software. However, this software is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the user. In no event shall the Authors be liable for damages arising from its use.

- 1.) http://www.who.int/cardiovascular_diseases/guidelines/Prevention_of_Cardiovascular_Disease/en/
- 2.) http://www.who.int/cardiovascular_diseases/guidelines/Pocket_GL_information/en/index.html

Part I

Getting Started

Installing Guardian

Before you can start using Guardian application, you'll need to download it and install it on your computer. We have provided a convenient one-click installer at

<http://bionet.ifc.cnr.it/guardian/download>

However, we do make some honest assumptions about your computer skills:

- **You know how to use the Mac Finder or Windows Explorer:**
We assume that you already know how to locate files and folders and that you can copy files and folders from one hard drive to another on the computer of your choice: a Mac or a Windows PC.
- **You know how to select menus and applications on a Mac or a Windows PC:**
We assume that you already know how to choose an option from a menu, how to find the Dock on a Mac to launch a Dock application (or use the Start menu in Windows to launch an application), and how to launch an application directly by double-clicking its icon.

Now let's look at the installation instructions for Windows and OS X.

Installing on Windows

To install Guardian, click on the download link **above**, choose the version you would like (i.e. click on the win link), and then click on the .exe link (under the name of the version) to download the installer. Use Windows Explorer to navigate to where you saved the .exe file and double-click on it to run the installer.

Installing on Mac OS X

To install Guardian, click on the download link **above**, choose the version you would like (i.e. click on the mac link), and then click on the .dmg link (under the name of the version) to download the installer. Use Finder to navigate to where you saved the .dmg file and double-click it to mount the disk. Now double click the guardian.pkg to run the installer.

Starting application

Here's how you get Guardian to start running.

With Microsoft Windows

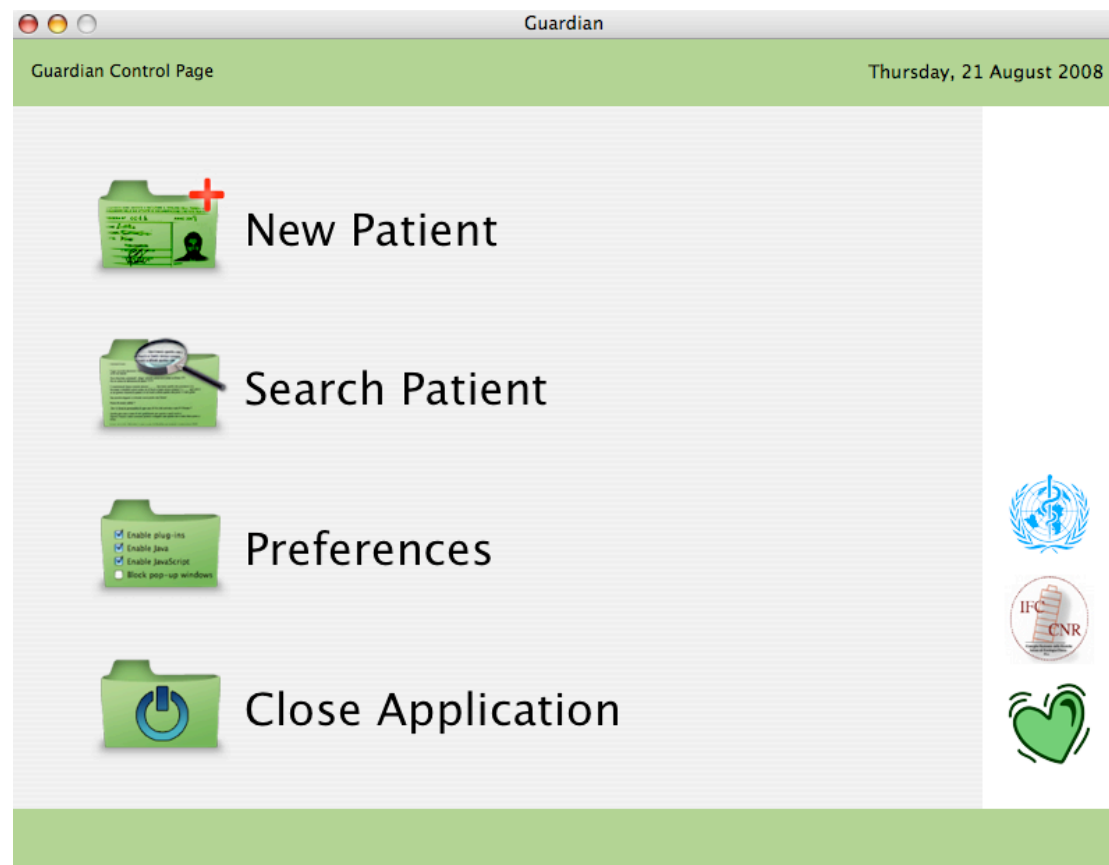
1. Choose Start->Run.
A Run dialog appears.
2. In the Run dialog, click the Browse button.
A Browse dialog appears.
3. In the Browse dialog, navigate to the directory in which you installed Guardian.
4. Double-click the Guardian (or Guardian.exe) icon.

You can also put a shortcut to Guardian on your Windows desktop.

On a Mac with OS X

1. Navigate to the folder in which you installed Guardian (default installation location is in the Application folder of your start-up disk)
2. Double-click the Guardian (or Guardian.app) icon.

The Guardian's main window appears:



Configuring Guardian

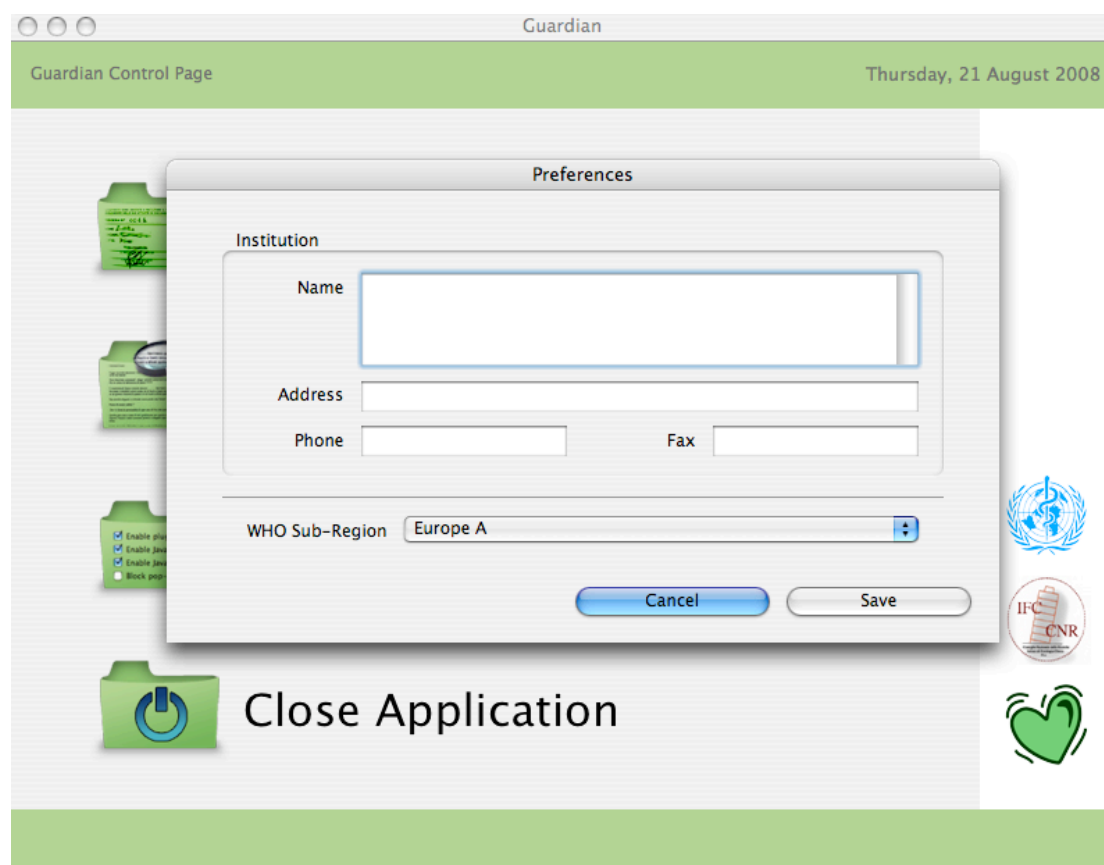
The Guardian comes with preinstalled WHO/ISH risk prediction charts used to estimate the cardiovascular risk for 14 WHO epidemiological sub-regions. Prior to using the application you'll need to select the appropriate region to use with.

This chapter describes the process of configuring Guardian application and the issues to be aware of when using the preinstalled risk prediction charts.

The following tutorial is provided to help you accomplish this task.

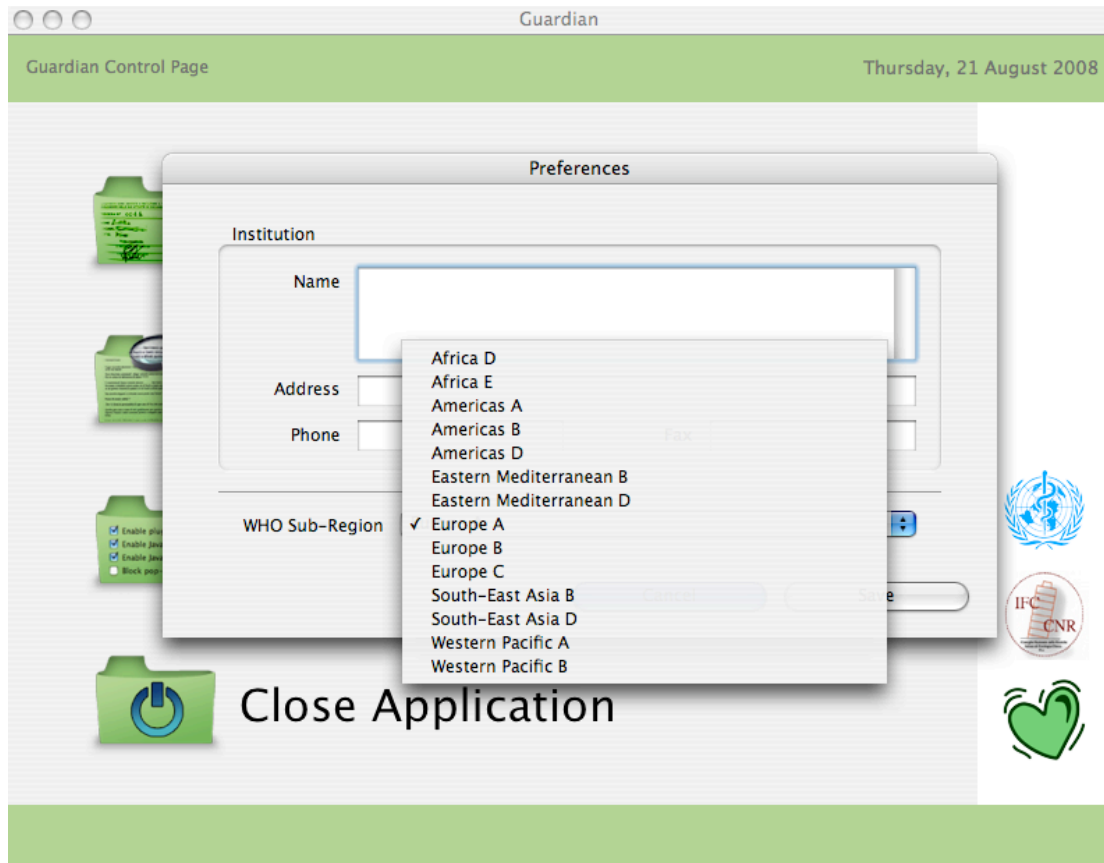
If not already running, launch Guardian application.

On **Guardian Control Page** click *Preferences*. The *Preferences* dialog box appears:



In the upper part you can enter Institution information (Name, Address, Phone and Fax numbers) using the Tab key to move to the next field or using the mouse to click in the desired field. *(This info is saved to be presented in the final report – not yet implemented)*

Click the WHO Sub-region pop-up menu to choose the region then click *Save*.



Clicking *Cancel* will close the *Preferences* without saving the newly entered data.

Quitting Guardian

To quit Guardian click *Close Application* from the **Guardian Control Page** or choose *Quit Guardian* from the Guardian menu.

Part II

Using Guardian

Evaluating/calculating cardiovascular disease (CVD) risk

The estimation of the 10-year CVD risk is done utilizing the WHO/ISH risk prediction charts. Individual risk charts are specific for individual WHO sub-region (see *Preferences*).

Clinical entry points are: age, sex, smoking habit, systolic blood pressure, total blood cholesterol, and the presence or absence of diabetes. If the measurement of blood cholesterol is not available, risk prediction charts that do not include cholesterol are used. Subjects with established cardiovascular disease are at very high risk irrespective of other clinical entry points.

The calculated 10-year CVD risk is reported in the final **Report**. The report will also contain the lifestyle and treatment recommendations based on risk stratification.

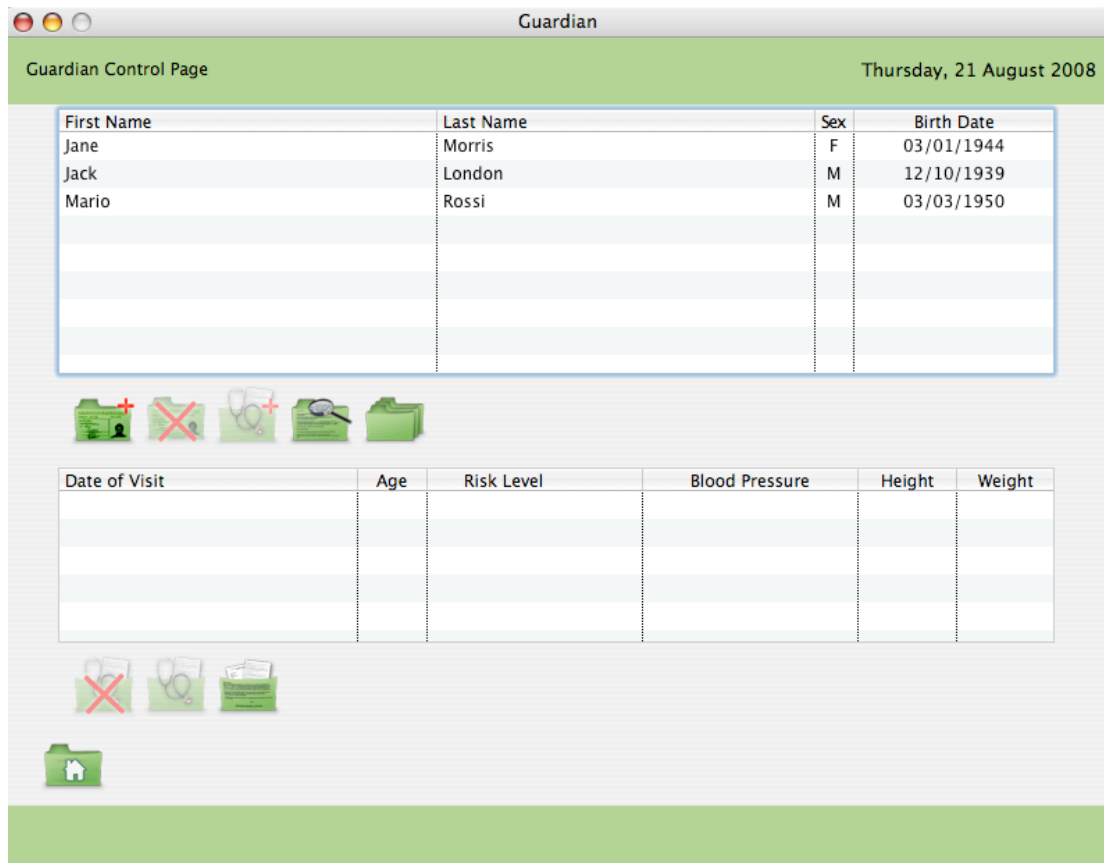
Creating new patient record

Click *Insert New Patient Data* from the *Guardian Control Page* to enter a new patient record. Three subsequent windows are presented: first the ***Personal Data*** window, then the ***Vital Statistics and Risk Factors*** window and finally the ***Clinical Conditions and Target Organ Damage*** window. Once information is completed a final report is generated automatically.

Browsing patient records

Click *Search Patient Data* from the **Guardian Control Page** to browse patient records (searching patient data, adding a new patient or a new visit for a patient already present in the database).

The **Guardian Control Page** window appears:



The screenshot shows a window titled "Guardian" with a green header bar. The header bar contains "Guardian Control Page" on the left and "Thursday, 21 August 2008" on the right. Below the header is a table with four columns: "First Name", "Last Name", "Sex", and "Birth Date". The table contains three rows of patient data. Below the table are four icons: a folder with a plus sign, a folder with a red X, a folder with a stethoscope and plus sign, and a folder with a magnifying glass. Below these icons is another table with six columns: "Date of Visit", "Age", "Risk Level", "Blood Pressure", "Height", and "Weight". Below this table are three icons: a folder with a red X, a folder with a stethoscope, and a folder with a document. At the bottom left is a home icon.

First Name	Last Name	Sex	Birth Date
Jane	Morris	F	03/01/1944
Jack	London	M	12/10/1939
Mario	Rossi	M	03/03/1950

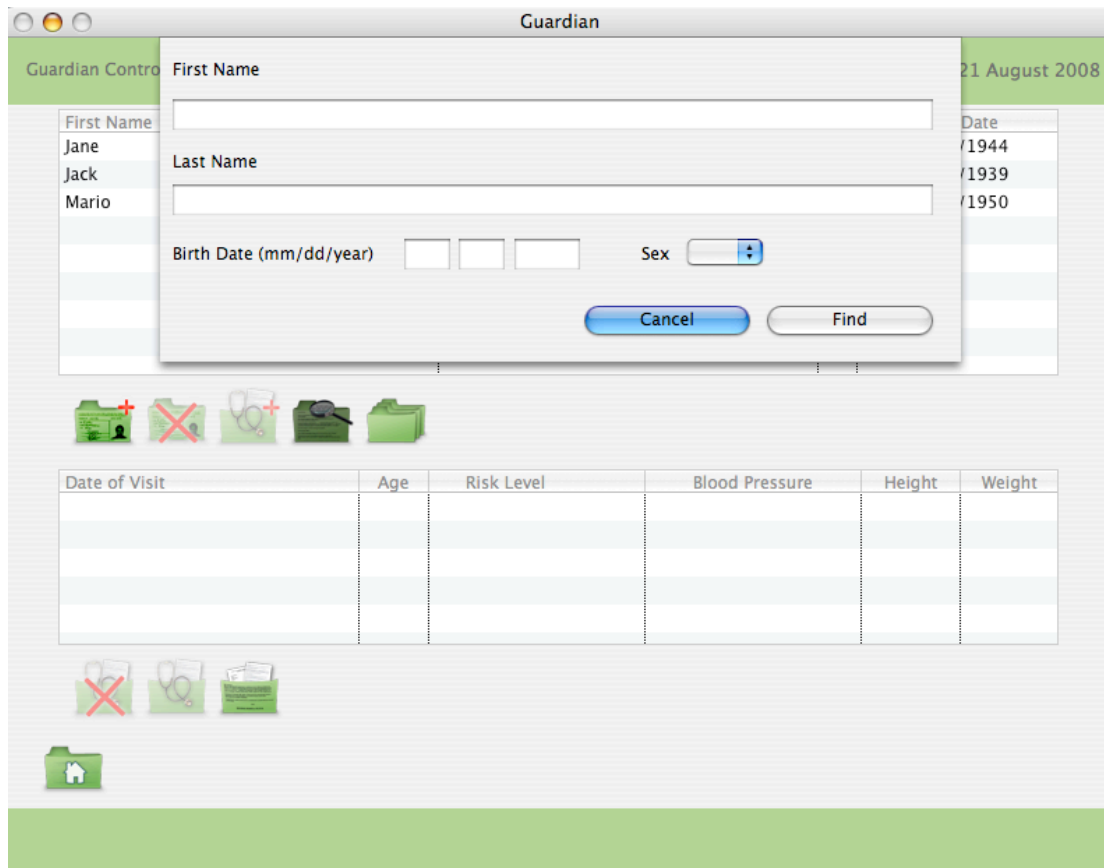
Date of Visit	Age	Risk Level	Blood Pressure	Height	Weight

The window is divided in two panels: the upper half shows the patient list, the lower half the total number of visits for the patient selected.

Below the upper panel some buttons permit you to:



- Insert New Patient Data (📁+);
- Delete (📁X) the record: notice that all the patient data will be lost;
- Create new visit (📁+🩺) for the selected patient;
- **Search** a patient record (🔍📁);
- Show all the records of the database (📁).


Select a patient record clicking on the appropriate row of the list **or search a patient record clicking** 📁. A dialog box appears:



Enter one or more search criteria and click *Find*. Guardian will show the result (if any).

Once a record is selected, the total number of visits is presented in the lower half panel.

Choose the visit of interest clicking on the appropriate row and then click on  to examine the **Vital Statistics and Risk Factors** or on  to examine the pertinent **Report**. Notice that you can't modify them.

Clicking on  all the data of that visit will be deleted.

Click on  to close the *Search Patient Data* window.

Generating report

A final **Report** is automatically generated:

Summary Page - EUROPE A Thursday, 21 August 2008

REPORT OF VISIT
Date 01/02/2008
(number of visits including this visit: 1)

PATIENT DATA
Name: Jane Morris
Sex: Female
Date of birth: 03/01/1944

Age: 64
Weight: 65 kg
BMI: 22.49
Smoking Habit: <1 year stop smoking
Alcohol Intake: Up To 3 Units/Day
Blood Pressure: 158/95 mmHg
Total Cholesterol: 6 mmol/l
Fasting Blood Glucose: 0 mmol/l
Diabetes: Yes

RISK ASSESSMENT
According to WHO 2007 guidelines, the

The risk level is MODERATE (10-19.9%)

RECOMMENDATIONS

SMOKING CESSATION
Patient should be strongly encouraged not to restart smoking.


DIETARY CHANGES
Patient should control total fat and saturated fat intake. Total fat intake should be less than 30% of calories, saturated fat intake should be limited to less than 10% of calories and trans-fatty acids eliminated. Most dietary fat should be polyunsaturated (up to 10% of calories) or monounsaturated (10-15% of calories). He/she should also reduce daily salt intake by at least one-third and, if possible, to <5 g or 90 mmol per day. Finally, he/she should eat, at least 400 g a day, of a range fruits and vegetables, as well as whole grains and pulses.

PHYSICAL ACTIVITY
Patient should take at least 30 minutes of moderate physical activity (e.g. brisk walking) a day, through leisure time, daily tasks and work-related physical activity.

WEIGHT CONTROL

The left panel shows the Report of the Visit, the Patient Data and the Risk Assessment.


The right panel shows the Recommendations (in terms of lifestyle changes and drug treatment) for prevention of cardiovascular disease in people with cardiovascular risk factors (according to individual total risk).

Click on  to go to the Guardian's main window. A dialog box will ask to *Save* data. If you don't save all the session will be lost.

Click on  to go to the **Personal Data** window.

Click on  to go to the **Vital Statistics and Risk Factors** window.

Click on  to go to the **Clinical Conditions and Target Organ Damage** window.

Click on  to print the **Report**.


Personal data





The screenshot shows a window titled "Guardian" with a green header bar. The header bar contains "Personal Data" on the left and "Thursday, 21 August 2008" on the right. The main content area is white and contains the following form fields:

- First Name:** A text input field with a red asterisk to its right.
- Last Name:** A text input field with a red asterisk to its right.
- Maiden Name:** A text input field.
- Birth Date (mm/dd/year):** Three separate text input fields for month, day, and year, with a red asterisk to the right of the year field.
- Sex:** A dropdown menu with a red asterisk to its right.

At the bottom left, there are three icons: a home icon, a folder icon, and a folder icon with a document. At the bottom right, there are two green arrows: a left-pointing arrow and a right-pointing arrow.

Enter patient information using the Tab key or clicking in the desired field. Red asterisks indicate mandatory data. You can't go to the next page until these data are not appropriately entered.

Click on  to go to the **Guardian**'s main window. Notice that if all the mandatory data are entered, a dialog box will ask to save them (in this case you will save incomplete data of the patient i.e. only personal data). If mandatory data are not fully entered, they will be lost.

Click on  to go to the next page (Vital Statistics and Risk Factors). In the right corner of the window two green arrows ( ) facilitate the navigation. Note that the arrow  remains disabled until mandatory data are not entered.

Clinical data

The clinical data of the patient are collected in two windows: the **Vital Statistics and Risk Factors** and the **Clinical Conditions and Target Organ Damage**.

The screenshot shows a window titled "Guardian" with a green header bar. The header contains the text "Vital Statistics and Risk Factors - Patient aa ss Visit of 21/08/2008" on the left and "Thursday, 21 August 2008" on the right. The main content area is divided into several sections:


- Physical Parameters:** Includes input fields for Height(cm) and Weight(kg), and a calculated BMI of 0.0.
- Blood Pressure(mmHg):** Features a table for Systolic and Diastolic values with "1st" and "2nd" measurement rows, and a "Mean" row showing "0/0". A checkbox for "Persistent Raised Blood Pressure (>160-170/100-105 mmHg)" is present.
- Total Cholesterol(mmol/l):** An empty input field.
- Fasting Blood Glucose(mmol/l):** An empty input field and a checkbox for "Persistent Fasting Blood Glucose (>6 mmol/l) Despite Diet Control".
- Diabetes:** Radio buttons for "Yes" and "No".
- Lifestyle Risk Factors:**
 - Smoking Habit:** Radio buttons for "Current Smoker", "Non Smoker or >1 Year Ex-Smoker", and "<1 year stop smoking".
 - Alcohol Intake:** Radio buttons for "Non-alcoholic or up to 3 units/day" (selected) and ">3 alcohol units per day".


At the bottom left, there are icons for a home button, a folder, and a trash can. At the bottom right, there are left and right navigation arrows.

Red asterisks indicate mandatory data. You can't go to the next page until these data are not appropriately entered.




Enter the following information:

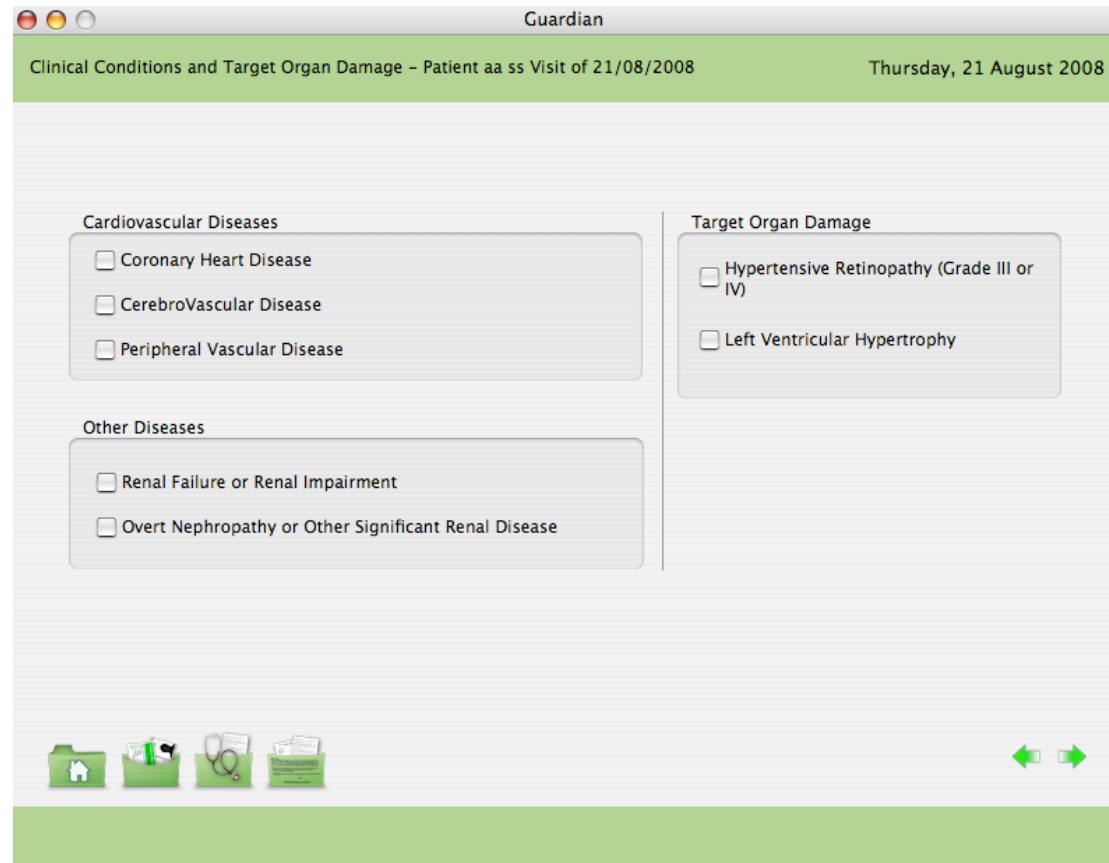
1. Physical parameters: height and weight, BMI is automatically calculated.
2. Blood Pressure: at least one measurement (systolic and diastolic values) is required. If a second measurement is available, insert it in the appropriate fields and the mean value will be calculated. Check the box of "Persistent Raised Blood Pressure" if appropriate.
3. Total cholesterol: if this parameter is not available, the system will use the WHO risk prediction charts that do not include cholesterol.
4. Fasting blood glucose: insert the value (if available) and then check the box of "Persistent Fasting Blood Glucose" if appropriate.
5. Diabetes: click the appropriate radio button.
6. Smoking habit: click the appropriate radio button.
7. Alcohol intake: if appropriate, check the box for "More Than 3 Units/Day" [one unit/drink = half pint of beer/lager (5% alcohol), 100 ml of wine (10% alcohol), spirits (40% alcohol)].

Click on  to go to the **Guardian**'s main window. A dialog box will ask to save data. If you don't save all the session will be lost.

Click on  to return to the **Personal Data** window.

Click on  to proceed to the **Clinical Conditions and Target Organ Damage** window.

In the right corner of the window two green arrows ( ) facilitate the navigation. Note that the arrow  remains disabled until mandatory data are not entered.





The screenshot shows a software window titled "Guardian" with a subtitle "Clinical Conditions and Target Organ Damage - Patient aa ss Visit of 21/08/2008" and a date "Thursday, 21 August 2008". The main content area is divided into three sections:

- Cardiovascular Diseases:** Contains three checkboxes: Coronary Heart Disease, CerebroVascular Disease, and Peripheral Vascular Disease.
- Other Diseases:** Contains two checkboxes: Renal Failure or Renal Impairment and Overt Nephropathy or Other Significant Renal Disease.
- Target Organ Damage:** Contains two checkboxes: Hypertensive Retinopathy (Grade III or IV) and Left Ventricular Hypertrophy.

At the bottom left, there are four icons: a home icon, a folder icon, a stethoscope icon, and a document icon. At the bottom right, there are two green arrows, one pointing left and one pointing right.



In the **Clinical Conditions and Target Organ Damage** window enter patient information checking the appropriate box/boxes. If none of these conditions is present, you can skip this section.

Click on  to go to the **Guardian**'s main window. A dialog box will ask to save data. If you don't save all the session will be lost.

Click on  to return to the **Personal Data** window.

Click on  to return to the **Vital Statistics and Risk Factors** window.

Click on  to proceed the **Report** window.

In the right corner of the window the two green arrows ( ) facilitate the navigation.

Printing report

The screenshot shows a window titled "Guardian" with a green header bar. The header bar contains "Summary Page - EUROPE A" on the left and "Thursday, 21 August 2008" on the right. The main content area is divided into two columns. The left column contains sections for "REPORT OF VISIT", "PATIENT DATA", and "RISK ASSESSMENT". The right column contains sections for "RECOMMENDATIONS", "SMOKING CESSATION", "DIETARY CHANGES", "PHYSICAL ACTIVITY", and "WEIGHT CONTROL". Below the "RISK ASSESSMENT" section, there is a yellow box with the text "The risk level is MODERATE (10-19.9%)". At the bottom of the window, there is a taskbar with several icons, including a printer icon. A green arrow points to the printer icon.

Guardian

Summary Page - EUROPE A Thursday, 21 August 2008

REPORT OF VISIT
Date 01/02/2008
(number of visits including this visit: 1)

PATIENT DATA
Name: Jane Morris
Sex: Female
Date of birth: 03/01/1944
Age: 64
Weight: 65 kg
BMI: 22.49
Smoking Habit: <1 year stop smoking
Alcohol Intake: Up To 3 Units/Day
Blood Pressure: 158/95 mmHg
Total Cholesterol: 6 mmol/l
Fasting Blood Glucose: 0 mmol/l
Diabetes: Yes

RISK ASSESSMENT
According to WHO 2007 guidelines, the

RECOMMENDATIONS


SMOKING CESSATION
Patient should be strongly encouraged not to restart smoking.

DIETARY CHANGES
Patient should control total fat and saturated fat intake. Total fat intake should be less than 30% of calories, saturated fat intake should be limited to less than 10% of calories and trans-fatty acids eliminated. Most dietary fat should be polyunsaturated (up to 10% of calories) or monounsaturated (10-15% of calories). He/she should also reduce daily salt intake by at least one-third and, if possible, to <5 g or 90 mmol per day. Finally, he/she should eat, at least 400 g a day, of a range fruits and vegetables, as well as whole grains and pulses.

PHYSICAL ACTIVITY
Patient should take at least 30 minutes of moderate physical activity (e.g. brisk walking) a day, through leisure time, daily tasks and work-related physical activity.

WEIGHT CONTROL

The risk level is MODERATE (10-19.9%)

Click on  to print the **Report**.

Saving data

The screenshot shows a window titled "Guardian" with a green header bar containing "Summary Page - EUROPE A" and "Thursday, 21 August 2008". The main content area is divided into several sections: "REPORT OF VISIT" (Date: 21/08/2008, 1 visit), "PATIENT DATA" (Name: Example Test, Sex: Female, Age: 63, Weight: 68 kg, BMI: 24.98, Ex-Smoker, Alcohol Intake, Blood Pressure, Total Cholesterol, Fasting Blood Glucose, Diabetes: Yes), "RECOMMENDATIONS" (SMOKING CESSATION: Patient should be encouraged not to start smoking.; DIETARY CHANGES: Total fat intake should be limited to... Most dietary fat should be monounsaturated (10-15% of total intake) or polyunsaturated (10-15% of total intake). If you eat meat, he/she should eat lean meat, as well as whole grains...), and "RISK ASSESSMENT" (The risk level is MODERATE (10-19.9%)). A dialog box is overlaid in the center with a yellow warning triangle icon and a heart icon. The text in the dialog box reads: "The current opened session has not been saved yet. Do you want to save it before closing it. If you don't, the currently edited data will be lost for ever". There are three buttons: "Don't Save", "Cancel", and "Save". The "Save" button is highlighted in blue. At the bottom of the window, there is a "Control Page" bar and a taskbar with several icons.

Click *Save* in the dialog box.